The Ballarat Naturalist

May 2001

Granite Tors (Strahler)

What Rock is That?

Club member Carol Hall was our April speaker, on the subject of Geology. As naturalists we don't spend much time on geology these days. Since Carol has accepted the position of editor I thought it appropriate to mention some extracts from a publication of the Naturalists' Field Club and Science Society, Ballarat, dated 1882…..their subject matter was mostly geology!

When Carol introduced her topic she gave a justification for talking about geology, explaining that the sort of plants which grow in a particular area are often influenced by the soil type which in turn depends upon the rock type and geological history of the region.

Starting with samples, she showed some well-known rocks e.g. granite, slate, basalt, limestone; she asked if we could explain why they were different. People mentioned that some were a result of others breaking down into particles which became cemented together such as sandstone—a *sedimentary* rock. Some resulted from being subjected to heat and pressure e.g. limestone being changed into marble—a *metamorphic* rock. Many rocks however are created from magma, originating in the mantle, the area between the crust and the core of the earth. Such *igneous* rocks are the ones from which the others are derived.

A table summarised the rocks in each of the three categories. Beginning with igneous rocks we saw slides of granite tors, and the Whin Sill in northern England used as a defensive rampart for Bamburgh Castle. Next were diagrams of different types of volcanoes followed by more excellent slides including Vesuvius and the surrounding area – scene of horrific destruction in historic times but now with vineyards on its slopes. We also saw Tower Hill with its complex of cones, craters and lakes, Devil's Kitchen and Red Rocks.

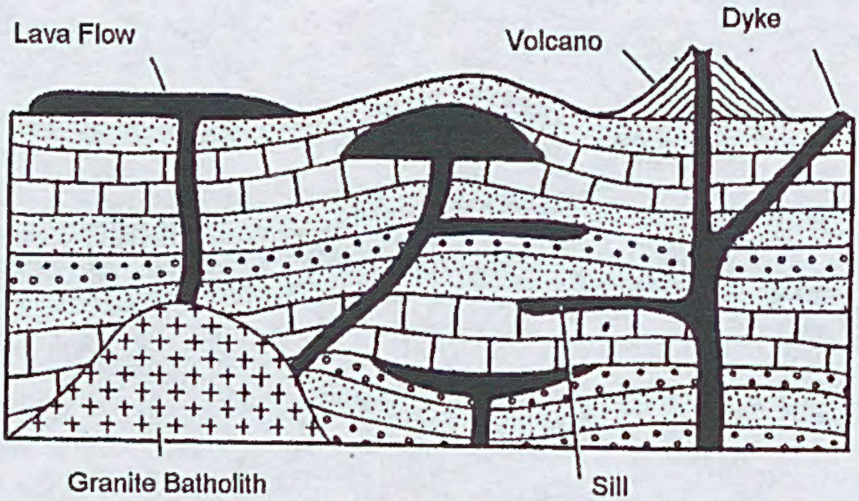


Diagram showing the chief types of igneous forms.

NB. They do not occur together like this.

(Bunnel)

Several examples of sedimentary rocks followed with comments on their content and origin:

- Sandstone: contains quartz, originating from sand.
- Limestone: containing calcium carbonate, originating from shells, etc.
- Coal: containing carbon-rich organic compounds, originating from plant fragments.

Once again the theory was followed by slides illustrating salient features of such rocks e.g. layers or bedding planes which may be in different orientations from when they were deposited—showing that considerable movement has taken place. An example is the vertically tilted beds which form Ayers Rock. And think how much material had been eroded to form it in the first place!

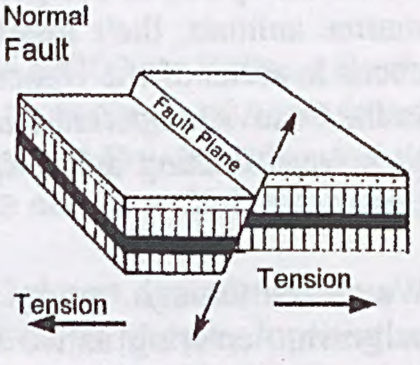
Carol also mentioned Chalk, a form of limestone we don't have in Australia and rich in fossilised marine life; it is peppered with nodules of flint—microcrystalline silica derived from dissolved skeletons of sea creatures and precipitated along joints and bedding planes. The eroded ledges of Bempton Cliffs (Yorkshire) provided nesting places for numerous kittiwakes and guillemots, while the action of running water on limestone creates caves with stalactites and stalagmites.

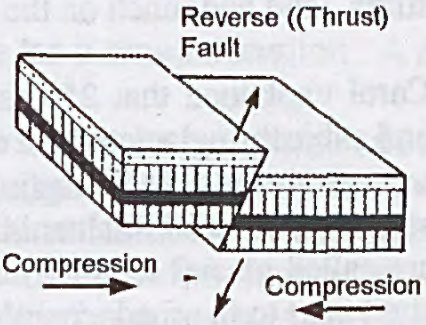
With enough pressure applied, rock can bend. We saw contrasting views of a small anticline in Castlemaine, and a huge syncline forming part of the Rocky Mountains between Jasper and Lake Louise in British Columbia. Obviously large forces are involved and over lengthy periods of time. Rocks also develop joints, illustrated by Tasmania's Tesselated Pavement.

If enough stress—tension or compression—is applied to rock it will crack; such a crack is known as a fault and the blocks of crust move relative to one another. Various types of faults were shown diagrammatically and illustrated with slides. Such structures show up well in aerial photography, such as Scotland's Great Glen Fault.

Carol explained the background behind the names given to geological periods such as Cambrian, Ordovician and so on, then summed up the reasons for many of the geological processes described—plate tectonics (formerly called Continental Drift). The plates, which move on convection currents in the earth's mantle, move apart along mid-oceanic ridges and rift valleys and cause volcanic activity. Where plates meet, they result in uplift, folding, tilting, volcanic activity and the emplacement of granite batholiths. Earthquakes occur along these plate boundaries and other faults when movement occurs.

Brian Andrews/Carol Hall





Geology in the Field - Excursion

Sunday's excursion aimed to illustrate some of the points made in Friday's lecture. The oldest rocks we were to see were the sandstones, shales and mudstones of the Ordovician period, which had been folded and faulted. In the Devonian period the granite was injected into these rocks. There followed a long period of uplift and erosion, uncovering the granite. During the Permian, ice sheets moved in from the SW and deposited till. In Tertiary times volcanic activity began, covering much of the pre-existing low-lying rocks and leaving the resistant granite as islands in a sea of basalt.

Beginning at Lake Learmonth Carol explained that this feature was a maar (or ring-crater), an explosive eruption point which leaves a low ring of scoria around a flat floor. Where the floor is deep enough to fall below groundwater level a shallow lake forms. The view to the granite hills of Mts. Misery and Ercildoun was obscured by the cloud of a cold front which moved in at an inopportune moment, so we moved on to Mt. Bolton, one of a number of granite hills in the area.

The tors seen near the sandpit were described as the result of exfoliation caused by weathering along the joints in the granite. This process began underground when acids from rainfall and organic matter began to dissolve the softer feldspars and mica into tiny clay particles readily removed by wind and water. The resistant quartz is left behind – hence the nearby sandpit.

At Clunes Recreation Reserve our full complement of members (23) assembled at an embankment in the Ordovician strata where Carol spoke of her understanding of the nature and place in the geological column of graptolites. These were small colonial marine animals; their fossils in the form of carbonaceous and siliceous impressions occur in rocks of the Upper Cambrian to Carboniferous periods, but are so prevalent in the Ordovician period that they are used worldwide to correlate these rocks. Graptolites were floating animals, individual polyps living in the cup-like tips of hollow tubes.

We passed through grassy plains on the basalt on the way to Campbelltown, entering native forest as we passed onto the Ordovician strata, and had lunch on the Newstead side of Campbelltown.

Carol explained that 250 m.y. ago Australia was part of Gondwana and subject to glaciation. It is postulated that ice sheets spread in Victoria from the SW indicating a spreading source located off the present west coast of Tasmania. Large rocks carried far from their source are called glacial erratics, one of which was to be found conveniently sited next to the road, complete with a sheared face and scratch marks, and was about half the size of a VW!

Quartz
(Rutley)

In a road cutting opposite, Carol pointed out the line of the Campbelltown Fault. This was defined by a paler line of soil and rock which was a thrust fault where the left side had overhung the right. On the left the Ordovician sandstones abutted the Permian till which would once have been more widely spread. It consisted of a relatively loose assortment of sub-angular fragments of a variety of rocks, to which the erratic was related.

Apart from the small outcrop of till, this was all Ordovician country, infertile and not cleared by settlers, still with grey box and yellow gum cover.

Now we headed towards the far more fertile basalt flow, much more recent in origin. Our last stop was at Mt Franklin, a steep sided scoria cone and a feature of the volcanic areas of Victoria. These are among the youngest landforms and little modified by erosion. Mt. Franklin is breached on its SW side but plantations here obscure the view towards Mt. Moorookyle and Smeaton Hill from the summit.

Carol described volcanic bombs (ref. FNCB newsletter Feb. 2000) -collectors' items-often rich in secondary minerals e.g. calcite, aragonite and olivine, and formerly found in this environment. We were fortunate to find a number of calcite crystals here both loose and embedded in basalt.

At this point our day concluded, and we now have vivid memories of the rich geological history in our own "backyard".

Tony Johns/Carol Hall.

April Meeting Points

- VFNCA Rawson Campout: Interest-free loan of $3200 for Ballarat Bushland Book approved, repayable in 5 years from proceeds of book sales.
- Webpage on ballarat.yourguide.com.au: Seminar at Courier attended by several members; C Hall and J Gregurke have added a Club information page.
- The President thanked past President Claire Dalman, welcomed new committee member Les Hanrahan, and thanked Pat Murphy for long service on the Committee.
- Lake Wendouree CD: Copies will be available for a small donation. A list was circulated for members to order a copy.
- Newsletter: Suggestions for a title for the newsletter are sought. A decision will be made at the next club meeting. Suggestions already received are: Goodenia, Ballarat Field Nats. News, Ballarat Naturalist, Fossicker, Scribbly Gum. Editor, Carol Hall, outlined her ideas for the newsletter and sought contributions from members including book reviews and web sites.
- *Snowgum* is offering free membership of its club to organisations such as ours; upon production of your club ID they will give you 10% discount on purchases.
- Excursion leaders and venues for mid-month excursions - suggestions and volunteers needed.
- Ballarat Bushland Book: That the Club reaffirm the decision to publish the Ballarat Bushland Book using $800 Community Grant from Ballarat City Council and a Loan of $3200 from VFNCA. Moved John Gregurke, Seconded Claire Dalman. Carried.

  Request was made for volunteers to research and prepare notes of bushland sites.
- Moved by Claire Dalman that the Club send a sympathy card to former member, Bary Dowling, expressing our regret to hear of the death of his wife, Margaret.

Field Reports

- Carol Hall: 4 Wollemi Pines on display in Canberra Botanic Gardens.
- Tony Johns: Grey Fantail in garden at Drummond Street South.
- Greg Binns: Grey Fantail in a flock of Brown Thornbills for a week at Pleasant Street South.
- Claire Dalman: Grey bird of prey killed a smaller bird in Wendouree and flew off with it.
- Frank Harrap: Brown hawk or falcon over Mt Clear shopping centre.
- Kevin Andrews: Small tortoise in Lake Wendouree, appeared to have a parrot-like beak.

- Lyndsay Fink: Several dead kangaroos along Midland Highway at Williamson's Creek where trees and shrubs are growing close to the road.
- Brain Andrews: Tailed spiders *Arachnura higginsi*, a colony of 12 each with its own web (which were interconnected) and egg sac, and suspended from tree branches in garden. Initially looked like dry leaves caught in webs. In the house a Vespa sac spider *Supunna picta*, black and white with orange front legs, a very fast runner. *Argiope trifasciata* a species of St. Andrew's Cross spider on web with stabilimentum, in long grass on nature strip. All at Durham Lead in March.
- John Gregurke: 6-8 Swift Parrots feeding on remnant vegetation in Campbelltown cemetery April 8th.

Show and Tell.

- Lyndsay Fink: Various rock specimens.
- John Gregurke: Dainty Parasol fungi from vegetable garden in Wendouree in March.

Syllabus Correction

The dates for the lectures in October and November have been inadvertently transposed. The Stella Bedggood Memorial Lecture is on October **5th**, and Richard Naisbitt is speaking on November **2nd.**

Subscription reminder

Subs. for the year 2001 are now due and payable—please check with Bob Curtain if you are not sure whether you are financial.

Ballarat Bushland Booklet

An editorial sub-committee is to be formed to take this project forward. Members are invited to bring along their expertise in design and layout, cartography, proof-reading—botanical names as well as general English—and any other tasks.

Apollo Bay Camp-out, June 22-25 2001

We need to give final numbers for this weekend by May 14 so please indicate your intentions to the secretary.

Mid-month Excursion:

On Tuesday April 24 a potential "Ballarat Bushland Book "site was visited by four members: Mt Erip Flora Reserve and Happy Valley Crossing. Despite persistent drizzle—the fourth day of a much needed autumn break—a variety of plants was seen on Mt.Erip. The flowers of the Tiny Greenhood *Pterostylis parviflora* stood 15cm above the sodden leaf litter, with Little Grass Trees *X. minor, Dianella revoluta, Goodenia, Hovea* and *Pimelia* spp. Considerable quantities of lichen covered the ground and we found cushions of Cranberry Heath *Astroloma humifusum*, some in flower.

On these resistant sediments of the late Cambrian/early Ordovician the plant assemblage is characterised by Red Stringybark *E. macrorhynca* and Red Ironbark *E. sideroxylon* with some Broadleaved Peppermint *E. dives*; we found the typical understorey of Golden Wattle *A. pycnantha* and Gold-dust Wattle *A. acinacea*. Broadleaved Peppermint dominates on the higher ridges. We saw Large-leaf Bush Pea *Pultenaea daphnoides,* Narrow Leaf Bitter Pea *Daviesia mimosoides* and Heath Wattle *A. paradoxa.*

Slung between tree trunks were numerous raindropped cobwebs including those of the leaf-curling spiders and a golden orb-weaving spider. Small fruiting bodies of the fungus *Calocera* sp. grew on fallen branches.

Picking our way past mullock heaps and mine shafts we found Red Ironbarks in flower which were attracting Eastern Spinebills and Brown-headed Honeyeaters; Yellow Robins investigated us and we heard the White-eared Honeyeater.

At Happy Valley Crossing the Linton-Cape Clear road crosses Woady Yaloak Creek by means of a concrete causeway. A footpath leads upstream to a picnic area and here amongst the Red Gums *E. camaldulensis* and Wirilda *A. retinodes* a dead goat moth lay on the ground, its wingspan all of 15cm. Large fungi with sulphur-yellow gills grew near the water's edge. The cliff on the opposite bank, formed by the creek's incision, revealed vertical strata of the Mt Erip sediments, the joints and ledges providing footholds for Blackwood *A. melanoxylon,* Wirilda and Rock Correa *C. glabra*, the latter in flower. The recent downpour had left the creek full of sediment, and debris had been caught up in the shrubs alongside.

River Red Gum
(Sale)

In the neighbouring paddock Eastern Rosellas and Red-rumped Parrots fed on the ground, their bright colours vivid on a day of subdued lighting and mist. Three Jacky Winters hopped around a tree stump and a Little Eagle flew overhead; a white-plumed honeyeater flitted among the red gums. Red-browed finches appeared on the ground at our lunch spot. Magpies carolled and a grey thrush kept an inquisitive eye on us.

Carol Hall.

From the Media

Roger Thomas reported in *The Courier* 30/3/01 that a Tailed Emperor butterfly had been found dead in the grounds of Ballarat University. It is not normally found south of southern NSW; it may have come from the Castlemaine area where a small population has existed from 1993.

Pat Murphy

(Hill)

The *Queenscliff Herald* has a monthly environment column which is currently focussing on the Swan Bay Ramsar Wetland and its catchment. The March issue emphasises the importance of its seagrass meadows for the breeding, feeding and shelter sites for a large variety of marine life. Ocean currents bring in the larvae of King George whiting to feed in the sheltered environment, together with shrimps, sandhoppers, flounder, snails and worms. Black swans congregate in summer and autumn, while thousands of migratory waders arrive in October to feed on the intertidal mudflats, the largest in Pt. Phillip Bay, and the orange-bellied parrot overwinters in the saltmarsh vegetation.

Pat Murphy

(Reilly)

A tiny rise in sea temperature of 0.75°C over 50 years has produced an explosion of animal and plant life on Australia's sub-Antarctic Heard Island. *The Canberra Times* 30/3/01 reported that King penguins, fur seals and cormorant populations have multiplied and areas once covered in glaciers are lush with plants. 80% of the island is still ice-covered but the retreat of glaciers from the coastline is altering the island's shape. Two processes are operating—continued recovery from the last Ice Age and current global warming.

C. Hall

On Easter Sunday the bilby sanctuary at Currawinga N.P. in Queensland was opened. 40 bilbies raised at the Parks & Wildlife Centre at Charleville will be released there in June, after a baiting campaign to rid the park of foxes and feral cats.

Bilbies, desert dwelling bandicoots that live in burrows once thrived across 70% of Australia but since white settlement have been driven almost to extinction by the spread of farming and grazing and introduced predators. They have a gestation period of 12-14 days and it is hoped the 40 in the sanctuary will increase to 400 in 18 months. They will then be allowed to spread beyond the sanctuary after predator culls by landowners and park rangers. *Weekend Australian* April 14-15 2001.

C. Hall

The Upside Down Fly: This tiny fly is only 2-3mm long and lives entirely on the cunjevoi lily *Alocasia brisbanensis.* Curiously it runs rapidly around on the surface of the leaves, always with its head pointing towards the ground. The adult female is attracted inside the flower of the lily by its scent where it is then entombed. The flower consists of a central rod with female flowers at the base and male flowers at the top. There is a sheath which at first for about one day loosely encircles the female parts at the base, but is open above where the male flowers are located.

The female flowers open first within the sheath, while glands below them give off the scent to attract the fly and other insects, which have already been dusted with pollen from other plants of this species. Before its own pollen is produced, the sheath clamps shut above the female flowers but below the still developing male flowers, thus trapping all the insects inside where they must stay until the fruit is ripe and the sheath finally splits open. In this way the plant is cross-fertilized but avoids self-fertilization. But life in jail is pretty good.

The female lays her eggs between the developing fruit in the liquid in the bottom of the flower. Her young spend their lives in safety as larvae feeding in this liquid, eventually pupating and then hatching out as adult flies who then wait for the prison gates to open. Upon release, they mate and then get locked up in another jail.

There are only two other species in this primitive family of flies. They are to be found on the African section of old Gondwana in Zimbabwe and Malagasy. They are very poor fliers and therefore isolated in these countries.

Friends of the Coffs Harbour Botanical Gardens Newsletter, Jan 2001 pp. Margaret Martin

(Robin Hill)

Reviews

Web Sites:

Antarctica

The Australian Antarctic Division has just published a new online magazine at **antdiv.gov.au/magazine**. Divided into sections for research, operations, environment and history, international, and weather it covers a wide range of topics and provides innumerable links to other specialist sites. Through them I found the Scott Polar Research Institute, **(spri.cam.ac.uk)** and the British Antarctic Survey which has an excellent site **(antarctica.ac.uk)** including regularly updated illustrated diaries from both its research ships and the bases at Halley, Bird Island and Rothera.

Intergovernmental Panel on Climate Change.
www.ipcc.ch

This speech by the chairman Robert Watson in November 2000 outlines the measured changes in climate and the degree to which human activity may be influencing these changes. The impact of change on socio-economic sectors such as water, agriculture, fishing; ecological systems especially forests and coral reefs; and human health is discussed.

Predicted changes in sea level, temperature, shifts in climate zones and the incidence of extreme events are summarised. Future changes in the incidence of greenhouse gas emissions and the use of carbon sinks are considered.

Carol Hall, FNCB

Some websites listed in the newsletter of the Threatened Species Network:

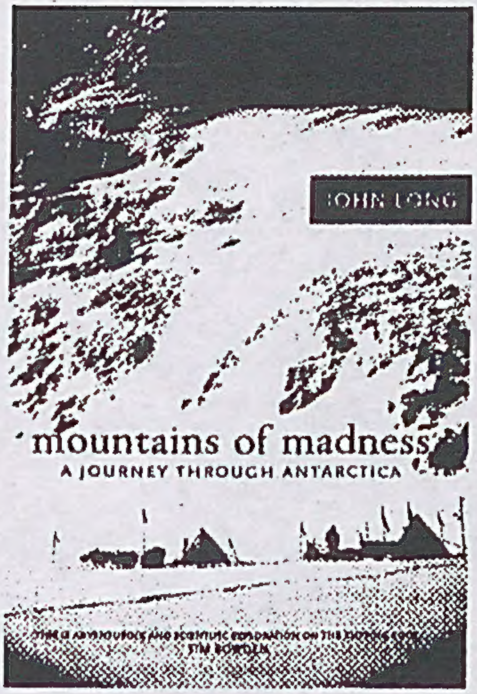
Field Naturalists' Club of Victoria	www.calcite.apana.org.au/fncv/
Australian Platypus Conservancy	www.totalretail.com/platypus
State of Victorian Rivers	www.vicwaterdata.net/isc
Threatened Bird Network	http://home.mira.net/~raou/

Books

The Wollemi Pine James Woodford pub. Text Publishing. Reviewer: Carol Hall.

The author is a science and environment writer for the Sydney Morning Herald. He describes the discovery of the pines by a NSW park ranger in the rugged Wollemi National Park with a sense of drama and excitement which continues through the book. Their eventual identification gives clues to Gondwana and the changing climate of Australia as the continent moved.

Bibliography, index, 8 pages of colour plates, several B&W photos. Limp. 212p. $27.



Mountains of Madness John Long pub. Allen & Unwin. Reviewer: Carol Hall, FNCB

Dr. John Long is a palaeontologist at the W.A. Museum. This book chronicles two summer expeditions to the Antarctic, especially the deep field trip to the remote Cook Mountains in 1991-2. He was searching for fish fossils from the Devonian period (400 m.y. ago). Together with his companions, flown in by Hercules helicopters, they camped, climbed and skidooed their way across virgin territory. Many new fossil species were recovered and named, providing evidence of how certain life forms in Gondwana were later carried by continental drift to distant parts of the globe.

This book is as much about the experiences of modern scientific exploration in Antarctica as about palaeontology and is written in a style readily accessible by the interested layman. Bibliography, index, 8 pages of colour plates. Limp. 238p. $24.95

A Field Guide to the Native Orchids of Southern Australia David and Barbara Jones. pub. Bloomings Books, Hawthorn. Reviewer: Pat Murphy, FNCB.

David and Barbara Jones have studied Australian native orchids for many years and have explored much of our country in their search for new species. David, with the assistance of his wife Barbara, has also written books on various plant groups, including ferns, palms, cycads, orchids and climbing plants.

The orchid enthusiast will appreciate this recently published field guide containing illustrations of 268 orchid species, each with scientific and common names, flowering time, detailed description, habitat and useful notes. The book deals with those orchids found south of latitude 27° I particularly like the Introduction section for its simple description of the Orchidaceae family as well as the clearly and simply written text which complements the large colour plates.

This book helps to stimulate interest in our unique orchids and provides a valuable contribution for people in the field.

However I feel the book lacks comprehension and I hope a second volume will be written to include the many orchids not featured in this first guide.

Nevertheless I recommend the book to all those who enjoy our wonderful Australian flora.

Calendar

May

Fri. 4	Meeting: *Cinnamon Fungus - Recovery after Dieback* Gretna Weste	
Sat. 5	Excursion: *Cinnamon Fungus* - Gretna Weste. Brisbane Ranges.	
Sat. 12	Eureka Vet. Clinic, Creswick Rd. 1.30pm. Geoff Williams, Director, Australian Platypus Conservancy. Slideshow, posters, etc.	
Mon. 21	Mid-month Excursion: Clunes State Forest. Leader TBA.	
Wed. 23	Committee Meeting @ C. Hall's,	7.30pm

Supper Duty for - May: Claire Dalman & Dulcie Brooke
June: Tony Johns & Eileen Anderson

Committee

President .... Mr. Brian Andrews
Vice-President .... Mr. Greg Binns
Secretary .... Mr. John Gregurke
Treasurer .... Mr. Bob Curtain

Miss Helen Burgess........
Miss Maureen Christie.....
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Mr. John Mildren............
Ms. Gail Whyte...............

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Email: Secretary:
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Website: www.ballarat.yourguide.com.au. Click on *Local Info.*

Meetings are held at the Ballarat Horticulture Centre, cnr. Gregory & Gillies Sts (VicRoads 254 F8) on the first Friday of the month at 7.30pm.

Excursions: Depart from Creswick Plaza, Creswick Rd., Ballarat (VicRoads 255 M10) at 9.30am unless otherwise specified.

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